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To: Nursing Homes

NH - 07

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cc: Susan Schroeder, Director  
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<b>Planning to Admit Ventilator Dependent Residents or Persons with Related Conditions</b>
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The Division of Health Care Financing has been receiving requests from nursing homes to allow placement of certain residents who are dependent upon electrically powered equipment such as ventilators to maintain life. There are certain physical plant requirements that must be met before admitting these residents. The main concern is that a dependable automatic power supply be available to sustain the life support systems needed for these residents.

The design of the facility's electrical system depends on the type of respiratory system the individual resident's condition warrants for continued respiratory function. For example, there are residents whose needs do not warrant 24-hour life support systems but who require the intermittent use of a ventilator when they are in a supine position. At a minimum, it is required that there be an alternate method of power source to prevent interruption of the system in the event of a power shortage.

The following National Fire Protection Association (NFPA) codes may apply to licensed and certified facilities depending on the services provided to the residents:

- NFPA 101 – Life Safety Code
- NFPA 70 – National Electric Code
- NFPA 99 – Health Care Facilities
- NFPA 110 – Standard for Emergency and Standby Power Systems

The following represents an edited version of the significant requirements for facilities that wish to accept residents on life support systems. Specific requirements are contained in the NFPA references.

1. NFPA recognizes two classes of nursing homes or residential custodial care facilities. For a smaller, less complex facility, only a minimum alternate service need be furnished. Where treatment is of a more complex nature, the requirements of section 517-40 through 517-44 (National Electric Code) are required to be applied.
2. An essential electrical system\* that is needed is comprised of two separate branches: life safety and critical.
3. An automatic transfer switch shall be provided for each branch. The purpose of the transfer switch is to transfer and retransfer the load automatically.
4. The essential electrical system shall have adequate capacity to meet the demand for the operation of all functions and equipment to be served by each branch at the same time.
5. The life safety branch and the critical branch of the emergency system\*\* shall be kept entirely independent of all other wiring and equipment and shall not enter the same raceways, boxes or cabinets with each other or other wiring.
6. Essential electrical systems shall have a minimum of two independent sources of power: a normal source generally supplying the entire electrical system, and one or more alternate sources for use when the normal source is interrupted.
7. The alternate source of power shall be a generator(s) driven by some form of prime mover(s) and located on the premises.

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\* Essential Electrical System: A system comprised of alternate sources of power and all connected distribution systems and ancillary equipment, designed to assure continuity of electrical power to designated areas and functions of a health care facility during disruption of normal power sources, and also designed to minimize disruption within the internal wiring system.

\*\* Emergency System: A system of feeders and branch circuits meeting the requirements of NFPA 70 National Electrical Code: Article 700; Emergency Systems, and intended to supply alternate power to a limited number of prescribed functions vital to the protection of life and patient safety, with automatic restoration of electrical power within ten seconds of the power interruption.

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8. The branches of the emergency system<sup>\*\*</sup> shall be installed and connected to the alternate power source so that all functions specified herein for the emergency system shall be automatically restored to operation within ten seconds after the interruption of the normal source.
  9. Each patient bed location shall be supplied by at least two branch circuits, one or more from the emergency system. At least one branch circuit shall supply one or more outlets only at that bed location. All emergency outlets have to be identified. The purpose of this requirement is to ensure that the circuit serving the patient room does not have any other receptacles serving other bed locations.
  10. The emergency system is required to be able to restart emergency loads that may have stopped.
  11. Audible and visual warning signal devices shall be provided to warn staff at nursing stations regarding the generator mis-operation.
  12. Internal combustion engines used for a generator, if needed, shall have an onsite full supply sufficient for at least two hours of full service operation.
  13. Prime movers (generator engines) shall not be solely dependent on a public utility gas system for their fuel supply or a municipal water supply for their cooling systems. Automatic transfer from one fuel supply to another is required when dual fuel systems are utilized.
  14. Generator sets that require more than ten seconds to develop power are acceptable, provided an auxiliary power supply is available that will energize the emergency system until the generators can pick up the load. An auxiliary power supply could include battery-operated or other types of generators.
  15. The generator room has to be maintained at a temperature of at least 50 degrees F., or the engine water jacket temperature maintained at not less than 70 degrees F.
  16. There are ventilators designed today for mobile usage that can operate up to 24 hours on an external 12-volt DC auto type battery. These units also have a sealed internal battery pack power system to operate the unit up to one hour. In the event of AC power failure, the unit automatically switches to the internal battery emergency power. Use of these units can be considered when the emergency power system does not switch over within ten seconds.

Questions regarding the specific code identified items, may be directed to David Soens, Quality Assurance Engineer, Provider Regulation and Quality Improvement Section, Bureau of Quality Assurance. David can be reached at (608) 261-5993.

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